

APTA

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Penn Station Utilization and Capacity Analysis

Tri-Venture:

NJT



LIRR

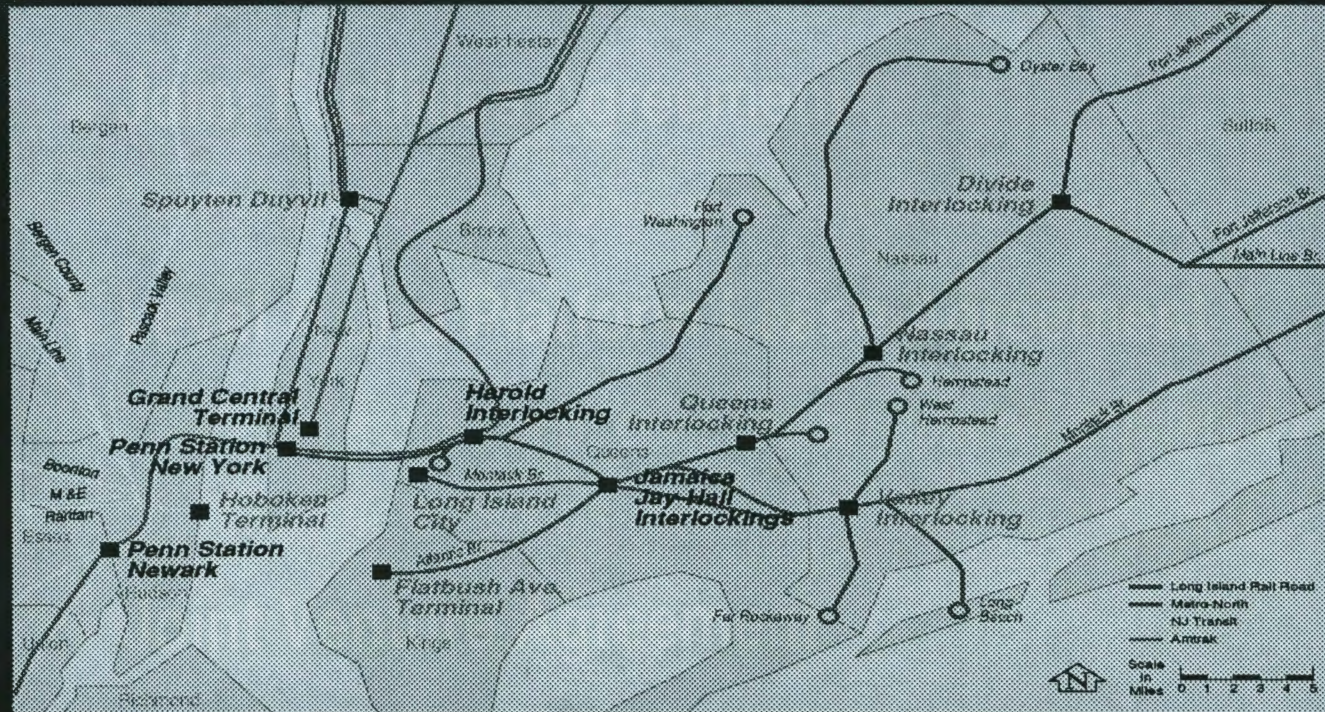


AMTRAK



Penn Station Capacity & Utilization Analysis Study

Penn
Station
Utilization
and
Capacity
Analysis



- Optimizing the Existing Infrastructures
- Determine System Wide Impacts of All Operational/Physical Modifications
- Evaluate Competing Alternatives
- Maximize Capital Return
- Reliability for Today & Tomorrow

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Penn Station Agency Agreements

Penn

- **Joint Facilities Agreement**

- *Establishes platform access & tunnel usage*

Station

- **Level A and Platform Lease Agreement**

- *Permits control of concession spaces & ability to renovate & reconstruct*

Utilization

and

- **Joint Venture Agreement**

- *Creation & implementation of a joint venture between AMTRAK & LIRR with a centralized control facility*

Capacity

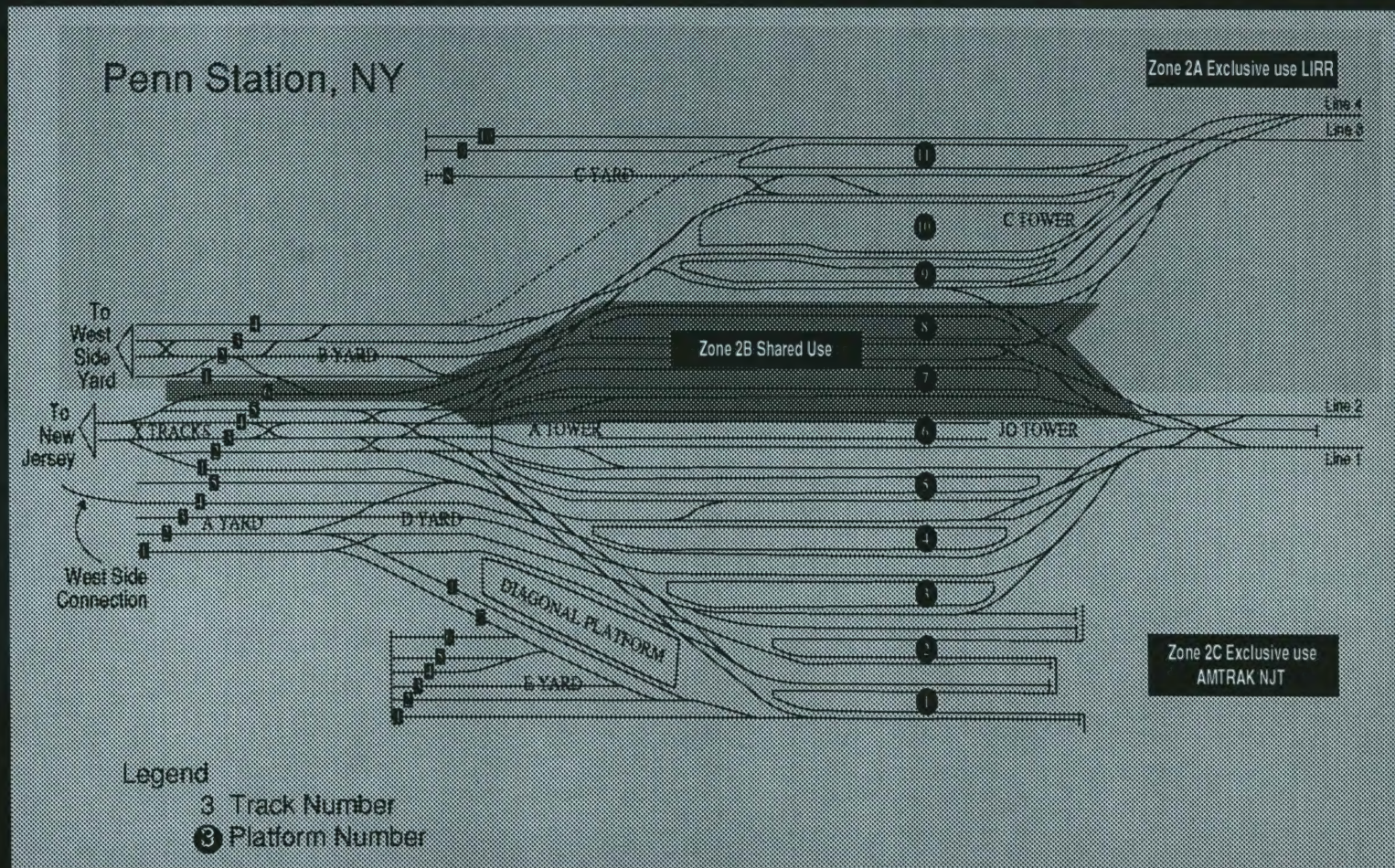
Analysis

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Joint Facility Agreement - Property Zones

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Station
Utilization
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Capacity
Analysis



Rail Plan Data Requirements

- **Civil Data**

Penn

- *Grades*
- *Curves*
- *Block Lengths*
- *Turnout Locations*
- *Platform Lengths*
- *Storage Capacity*

Station

Utilization

- **Operational Data**

and

- *Station Dwells*
- *Random Delays*
- *Parallel Routing*
- *Train types - speeds*
- *Timetables, Rules & General Orders*
- *Signal System*

Capacity

- **Output**

Analysis

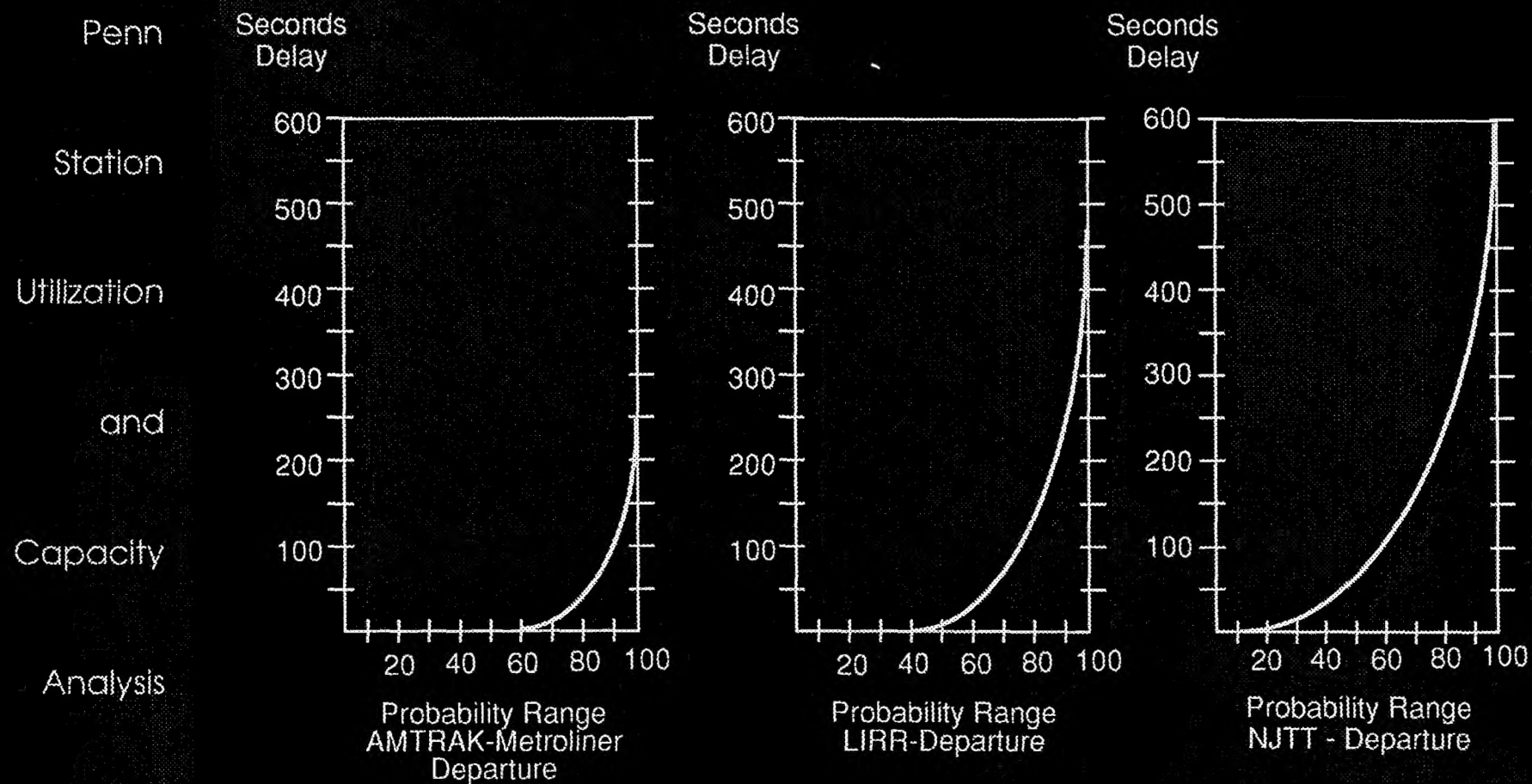
- *Results Orientated*
- *Conflict Locations*
- *Conflict by Train*



Station Dwells

Penn		AMTRAK	LIRR	NJT
Station	<i>Revenue to Revenue</i>	-	8	15
Utilization	<i>Revenue to Yard</i>	12 - 30	4	7
and	<i>Yard to Revenue</i>	15 - 30	5	7
Capacity	<i>Equipment to Revenue</i>	-	12	15
Analysis	<i>Revenue to Equipment</i>	-	12	10

Random Delay Curves



Service Expansion & Reliability Solutions

Penn

- **Signal Changes**

Station

- **Equipment Selection**

Utilization

- **Infrastructure Changes**

and

- *Lengthen platforms*

- *Switch modifiers*

Capacity

- **Grade Separation**

Analysis

- **Additional Access**

- *Pedestrian transfer locations*

- *Expansion of service area*

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Simulation - The Quantifier

Penn

Station

Utilization

and

Capacity

Analysis

- **Impact of Service Increases
Kearny Connection**

- **Analysis of Competing Alternatives
West Side Yard Connection**

- **Effectiveness of Operational Changes
Reversing Tunnel Directions**



Kearny Connection

Penn

Station

Utilization

and

Capacity

Analysis

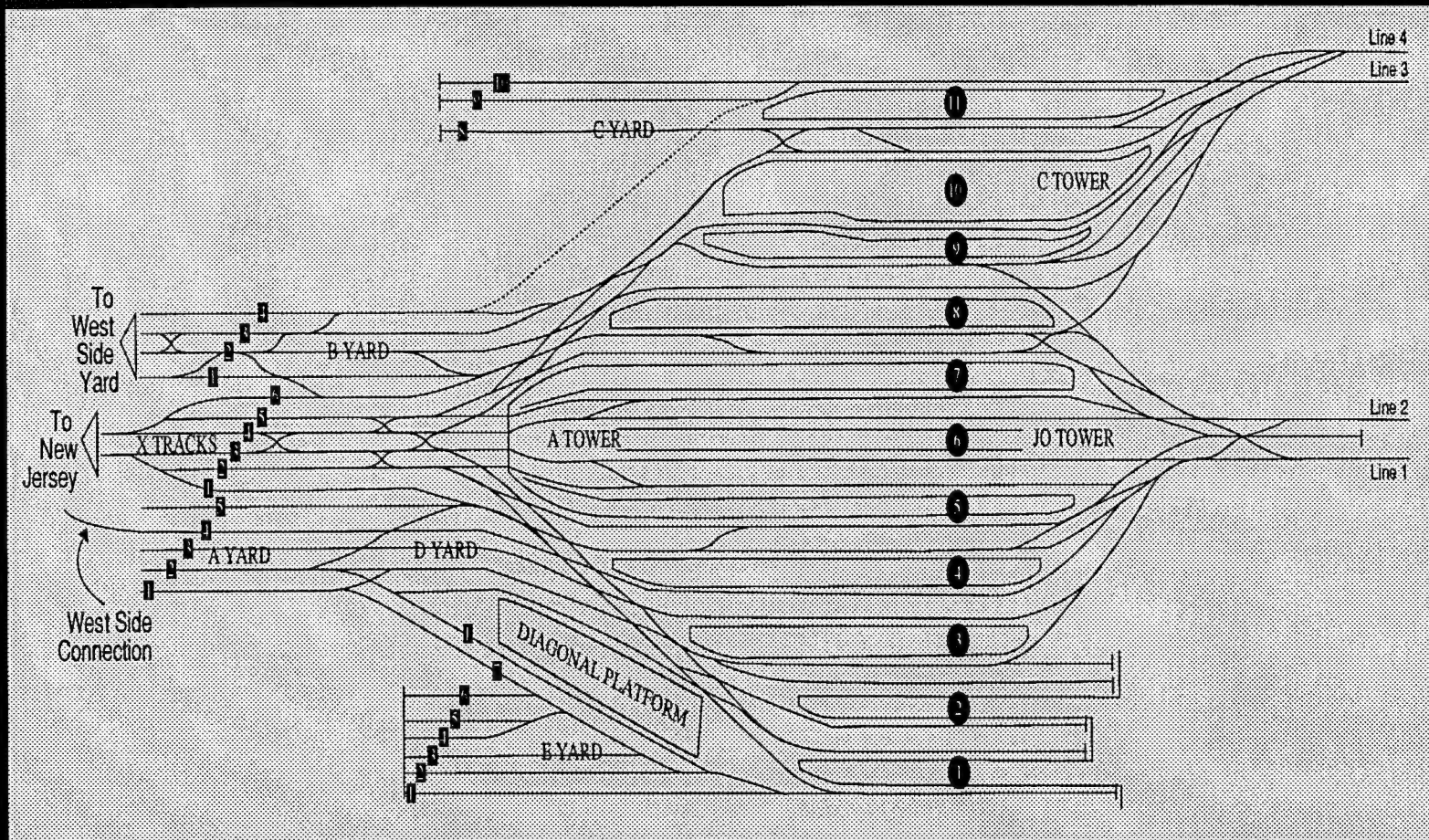
- **Increases Penn Station Service by 6 Trains per Hour**

- *Capacity constraints*
- *Station Platform Constraints*
- *Impacts to Amtrak & LIRR*



Penn Station Facility

Penn
Station
Utilization
and
Capacity
Analysis



Simulation - The Quantifier

Penn

Station

Utilization

and

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Analysis

- Impact of Service Increases
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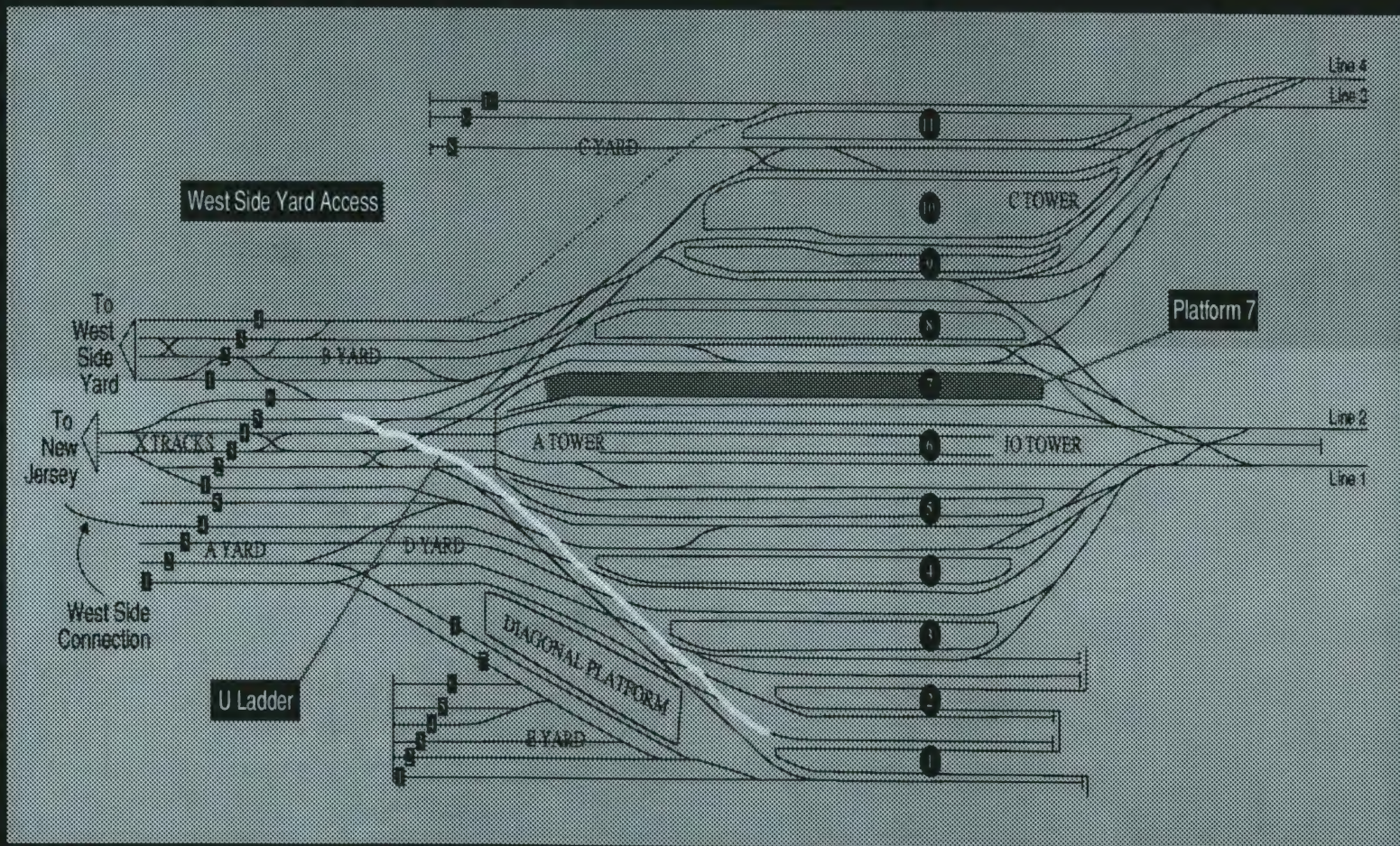
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Penn Station Facility

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U Ladder Alternative

Penn

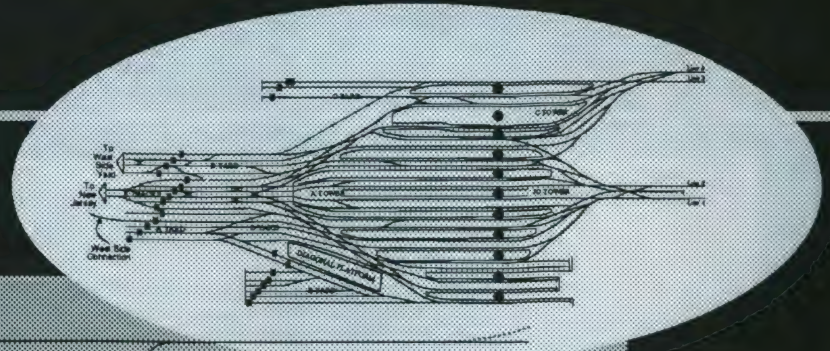
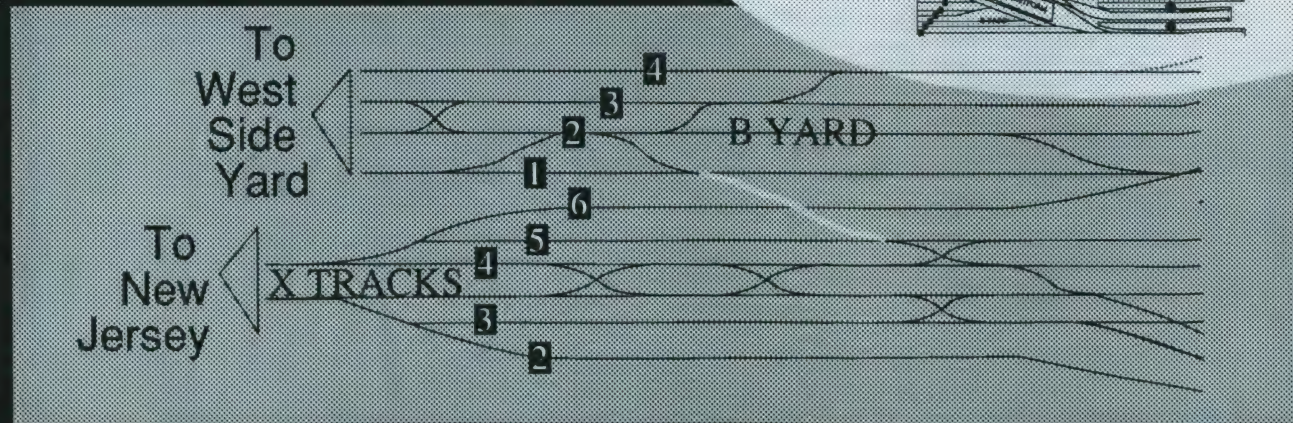
Station

Utilization

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Capacity

Analysis



- LIRR capable of accessing Zone 2A (Station Tracks 2-12)
- Possible conflict with Amtrak parallel move over U Ladder & crossover No. 83.
- Cost = \$3 million

A Interlocking & Parallel Routes

Penn

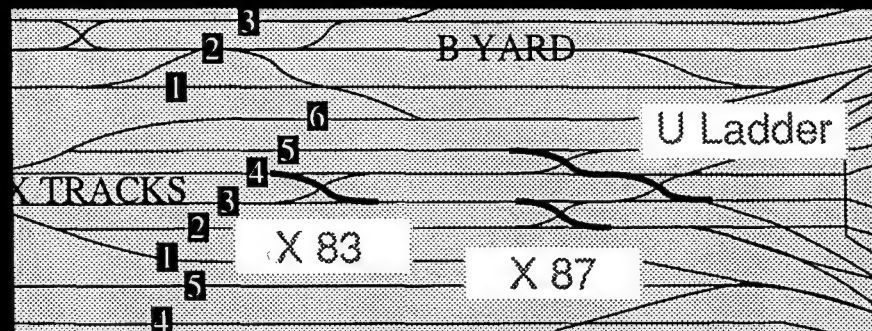
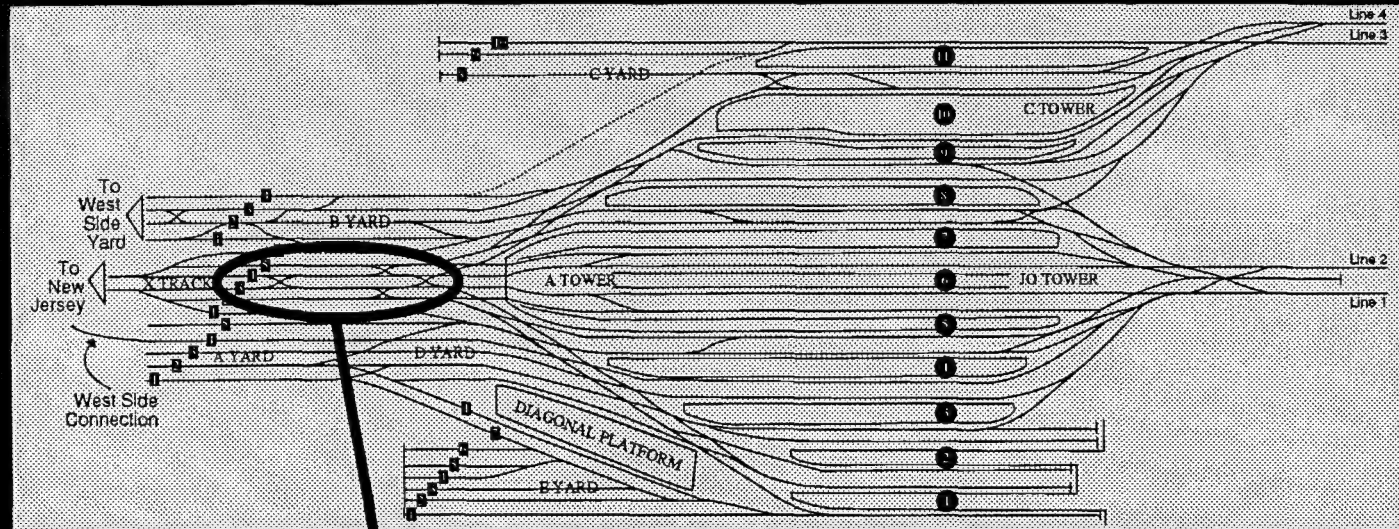
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Utilization

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5X- 6X Alternative

Penn

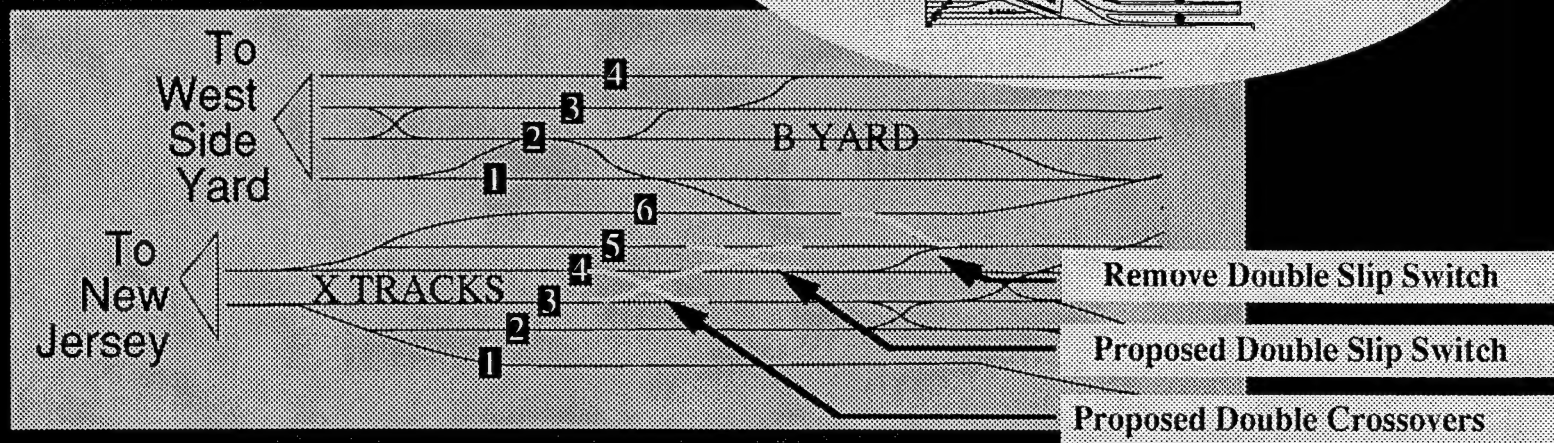
Station

Utilization

and

Capacity

Analysis



- LIRR restricted to Zone 2A & 2B (Station Tracks 13-21)
- AMTRAK maintains exclusive parallel moves
- Cost = \$12 million

5X - 6X vs. U Ladder: Impact of Random Delays

Penn

- **Model Simulated for 20 Days of Operation**

Station

- **No Additional Conflict Delays Caused by Installation of 5X/6X Connector**

Utilization

- **2.8 Train Minutes of Delay Experienced Over 20 Runs with U Ladder Connection (8.4 Seconds Delay Average)**

and

Capacity

- **Train 627 (5:14pm Clocker) Experiences all Delays**

Analysis



Simulation - The Quantifier

Penn

Station

Utilization

and

Capacity

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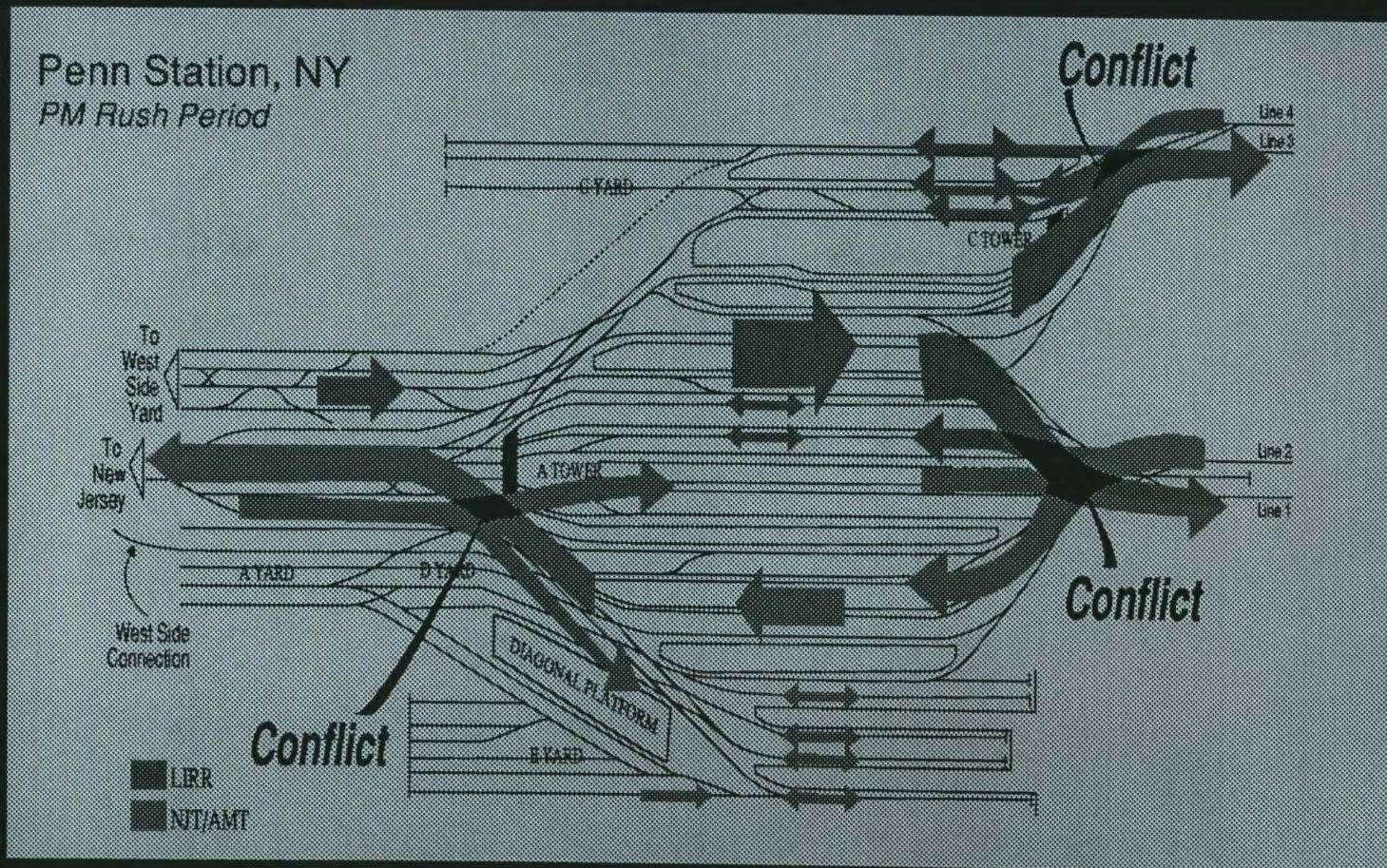
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Current Flow of Traffic

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Station
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Analysis



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Proposed Flow of Traffic

Penn

Station

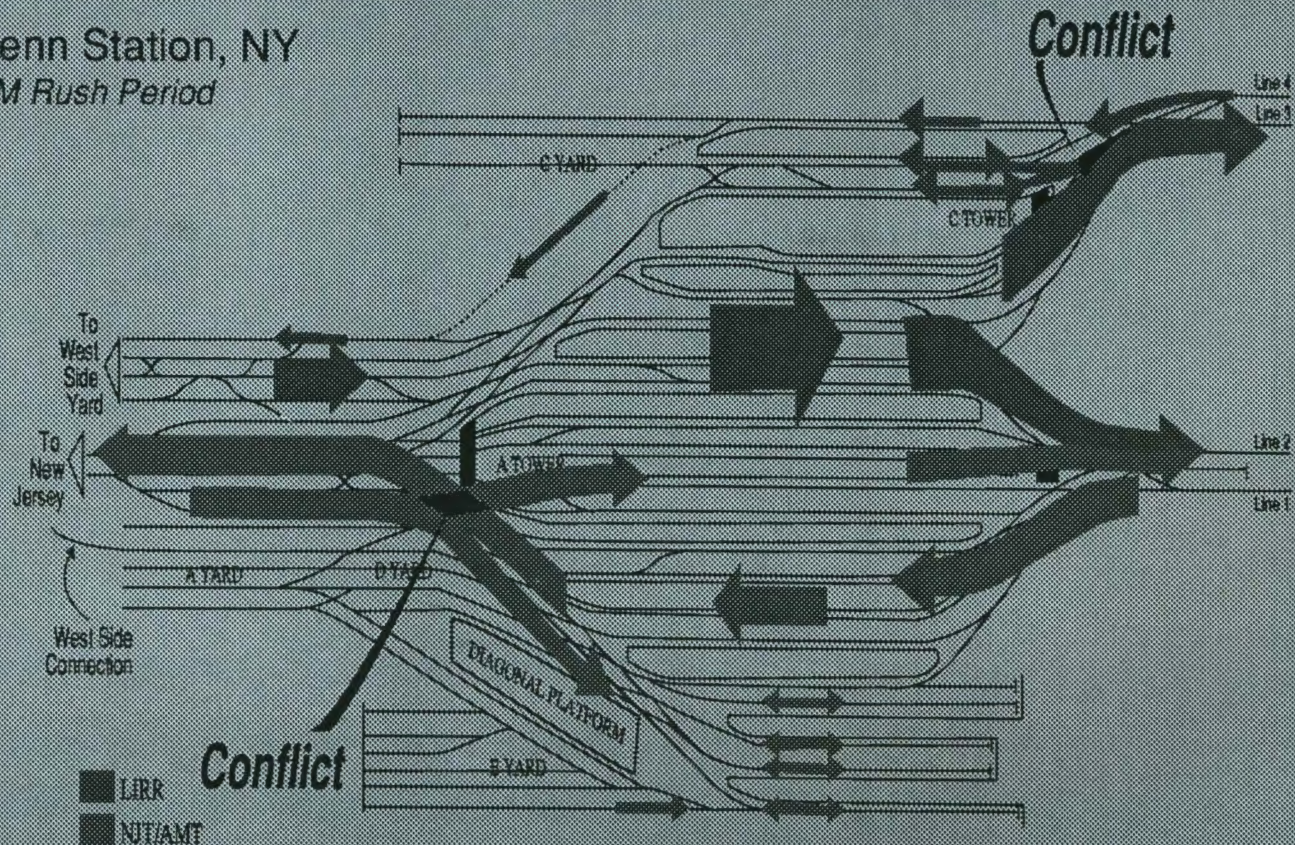
Utilization

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Capacity

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Penn Station, NY
PM Rush Period

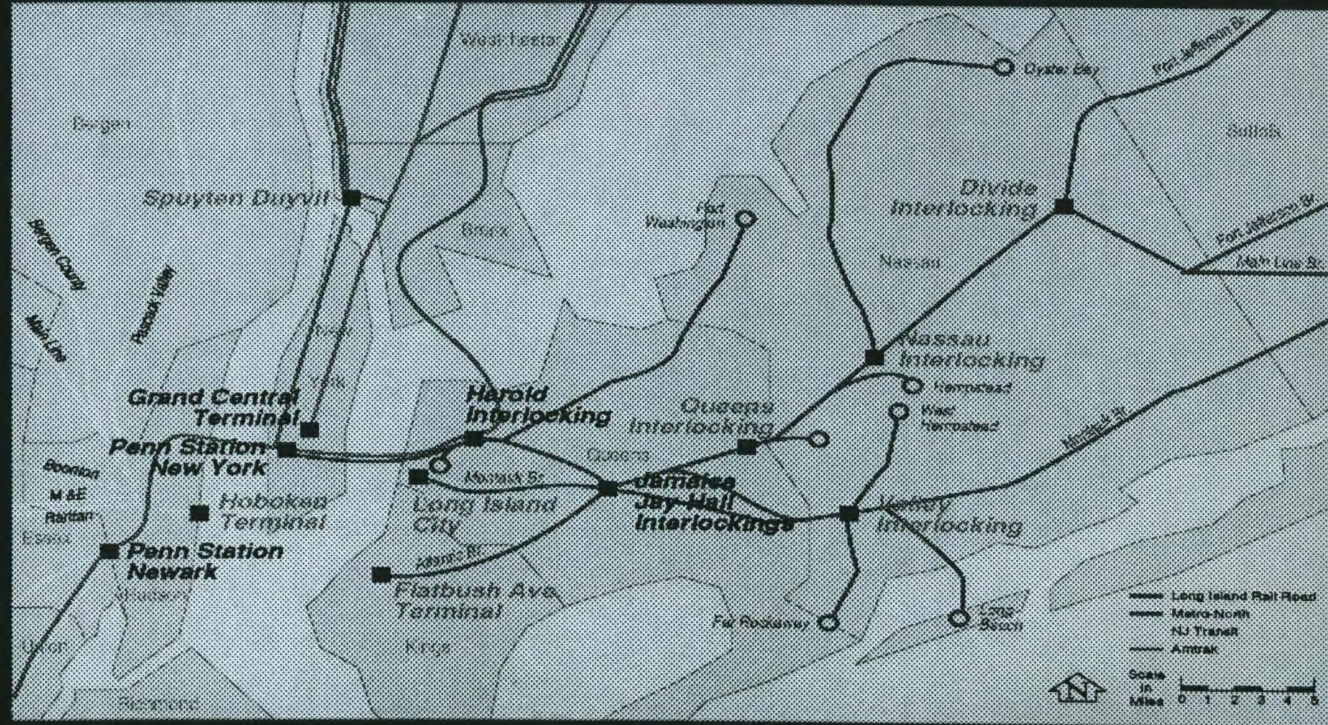


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